CHAPTER 2
BACKGROUND

2-1. Superfund Process.

a. General

(1) Section 105 of CERCLA, as amended by SARA, requires the U.S. Environmental Protection Agency (EPA) to maintain the NPL, which is a record of uncontrolled hazardous waste sites that have released or that pose a threat to release hazardous substances into the environment. Pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 Code of Federal Regulations Part 300 (40 CFR 300), sites on the NPL are eligible to receive CERCLA trust fund (Superfund) financing for RAs. Funding can only be provided for RAs at sites that are listed as final on the NPL.

(2) Prior to a site being listed on the NPL, a preliminary assessment/site inspection (PA/SI) is typically completed to collect the data necessary to develop a score for the site using the hazard ranking system (HRS). The HRS score ultimately determines the site's eligibility for inclusion on the NPL.

Lead Agencies

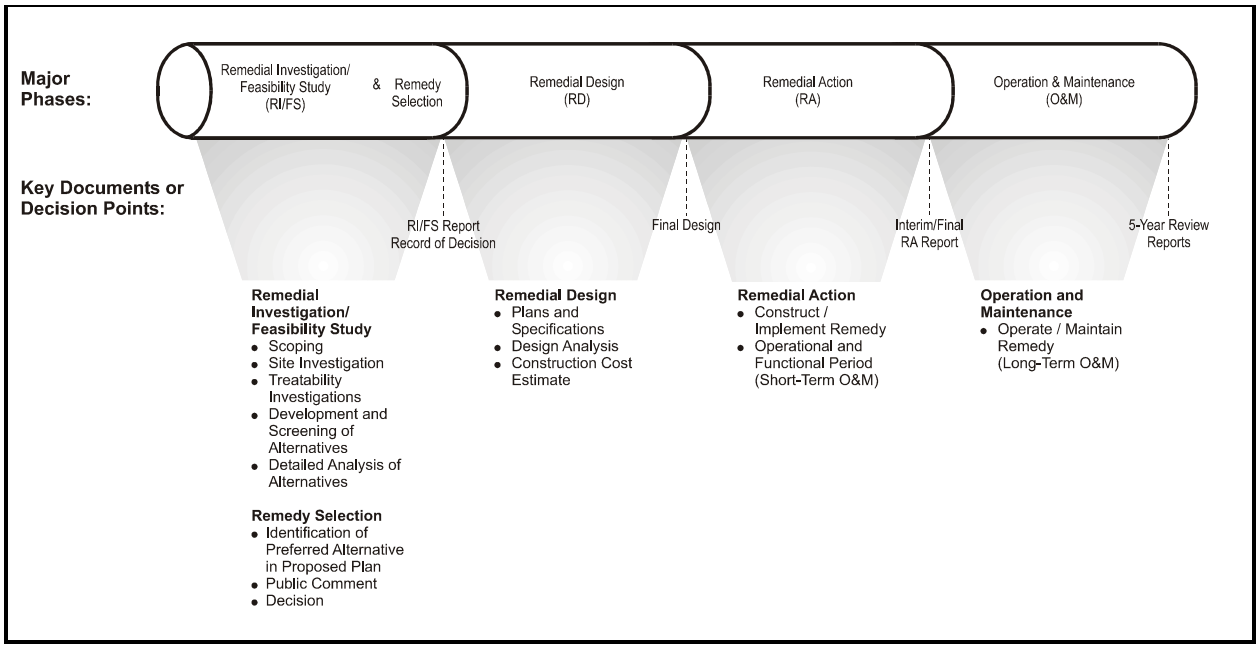
At or prior to the time a site is placed on the NPL, a determination of the lead agency is made. The lead agency, represented by a remedial project manager (RPM), has the primary responsibility for coordinating response action. EPA, a State environmental agency, or another Federal agency can serve as the lead agency. However, EPA retains final remedy selection authority for all "Fund-financed" actions, and for all Federal facility (FF)-led actions at NPL sites.* Generally, the lead agency RPM is responsible for overseeing all technical, enforcement, and financial aspects of a remedial response.

* The following terms are typically used to designate which government entity serves as the lead agency in the Superfund remedial response process: "EPA-lead," "State-lead," and "Federal facility-lead." In addition, the following terms refer to the source of remediation/cleanup monies: "Fund-financed" (i.e., remediation or cleanup money from the Superfund trust fund) and "potentially responsible party (PRP)-lead" (i.e., remediation or cleanup money derived from enforcement action taken by lead agency).

(3) Sites on the NPL are addressed by the Superfund process through a combination of removal and remedial authority. Removal actions are short-term responses, usually to address immediate threats.[1] Remedial actions achieve long-term permanent responses to risk. The Superfund pipeline (Exhibit 2-1) illustrates the major phases and decision points of the Superfund remedial response process. The various phases of this process are briefly described in the following paragraphs.

[1] Removal authority cleanup actions achieve prompt risk reduction through activities categorized as emergency (response required within hours/days), time-critical (response required within 6 months), or non-time-critical (more than 6 months is available before action must be taken). Non-time-critical removal alternatives are analyzed in an engineering evaluation/cost analysis (EE/CA), which is considered the equivalent of a remedial investigation/feasibility study. An action memorandum is the primary decision document, which is considered the equivalent of a record of decision.

Exhibit 2-1
The Superfund Pipeline



b. Remedial Investigation/Feasibility Study

(1) The remedial investigation/feasibility study (RI/FS) process is initiated at the time of a site's listing on the NPL. The RI/FS gathers the information necessary to select a remedy that will meet the statutory and regulatory requirements of the Superfund cleanup program.

(2) The objective of the RI is to collect the data necessary to assess the current and future potential risks to human health and the environment, and to support the development, evaluation and selection of appropriate response alternatives. The RI may be performed in several stages so that the investigation is refined as it progresses. The RI includes field investigations, treatability studies, a baseline risk assessment, and the initial identification of applicable or relevant and appropriate requirements (ARARs) (i.e., all State and Federal laws outside Superfund regulations that warrant consideration).

(3) The FS begins by formulating viable alternatives. This requires that contaminants of concern, potential exposure pathways, remediation objectives/cleanup goals, general response actions, subject volumes or areas of media, and potentially applicable technologies be identified.

An FS may address a specific site problem, OU, or an entire site.[2] Following the preliminary screening of alternatives, a reasonable number of possible alternatives undergo a detailed analysis using the nine evaluation criteria listed in the NCP.

c. Remedy Selection

(1) The preferred alternative remedy for a site or OU is discussed in detail and presented for public comment in the proposed plan. The proposed plan briefly summarizes the alternatives that were studied in detail during the RI/FS, and highlights the key factors that lead to the selection of the preferred alternative.

(2) Following the public comment period associated with the proposed plan, the ROD documents the selected remedy.[3] The ROD introduces the significant facts, presents an analysis of these facts, states the site-specific policy determinations, and explains how the nine evaluation criteria were considered in the remedy selection process. The remedy selection process must be carried out in accordance with CERCLA and, to the extent practicable, with the NCP.

Potentially Responsible Parties

Under CERCLA §104, a person or an entity potentially responsible for a release of hazardous substances, pollutants, or contaminants into the environment (i.e., a potentially responsible party (PRP)) may be allowed to conduct certain response actions in accordance with CERCLA §122, if a lead agency determines that the PRP, or the PRP's contractor, is qualified and capable. For a PRP-lead response action, either EPA or the state agency oversees the PRP's work and develops the ROD.* PRPs may participate in the remedy selection process by submitting comments on the proposed plan during the formal public comment period, held prior to the final remedy selection. However, PRPs generally should not be permitted to write or amend a ROD.

* For detailed information regarding PRP oversight, refer to *Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies*, Volumes 1 and 2 (EPA 540-G-91010a and b, July 1991).

(3) The ROD provides the framework for the transition into the next phase of the remedial process. Recommended content and format for the ROD can be found in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA 540-R-98-031, July 1999). The ROD describes the remedy's technical parameters, specifying the methods selected to protect human health and the environment, including the treatment, engineering, institutional control components, and remedial action objectives/cleanup goals. The ROD also provides a consolidated summary of the site or OU and the chosen remedy, including the rationale behind the selection.

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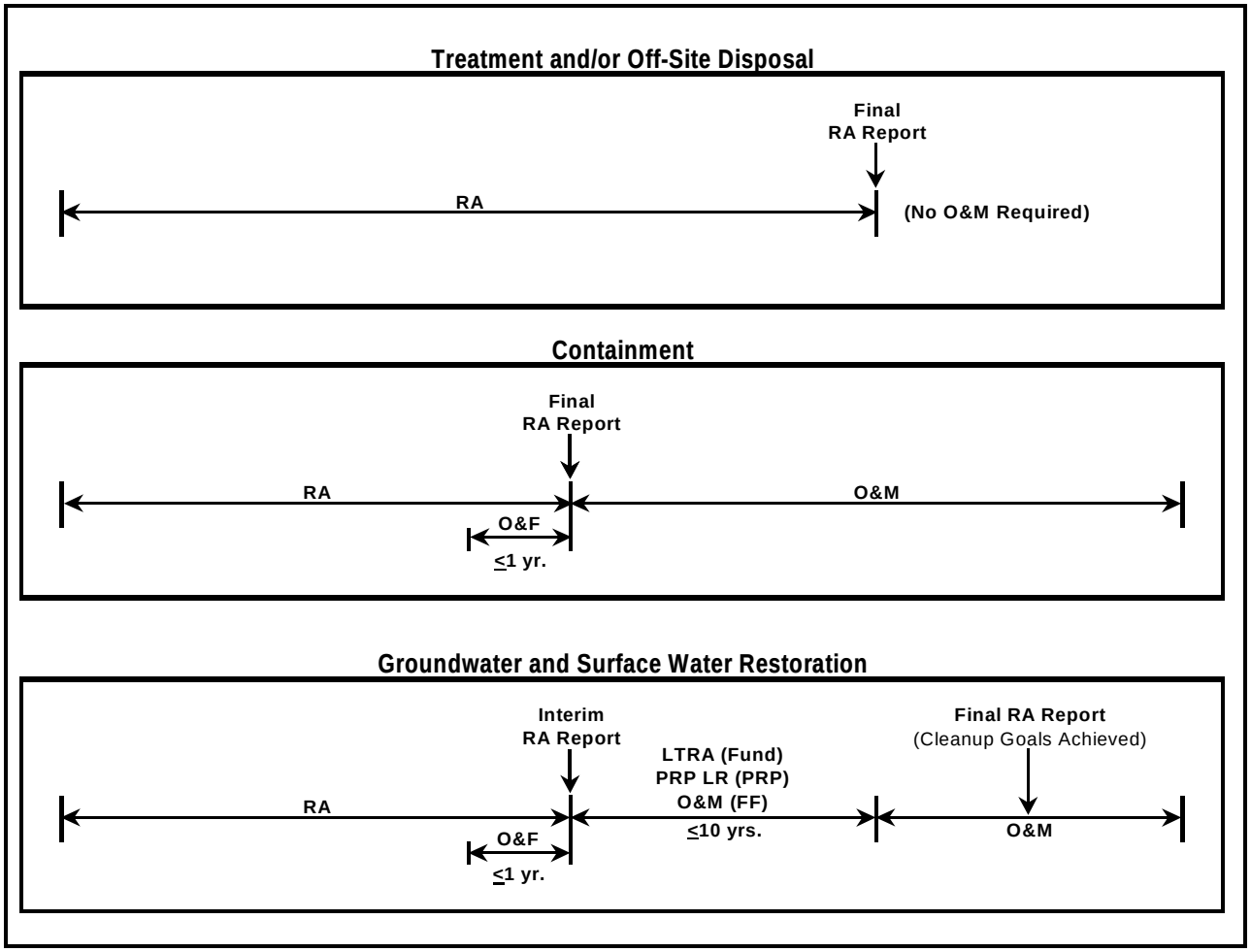
[2] The RI/FS can be performed for the site as a whole, or for a particular portion of the site. The NCP defines an OU as a "discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure" (NCP §300.5). Hence, an OU can be a certain geographic portion of a site or a specific environmental medium at the site (e.g., groundwater or soil). The OU may also consist of a comprehensive but temporary remedy (e.g., a temporary cap over a site) that provides interim protection of human health and the environment before final remediation. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site.

[3] For pre-SARA sites, the selected remedy may be detailed in other reports (e.g., a consent decree or an administrative order).

d. Remedial Design. Plans, specifications, and other documents necessary to construct or implement the remedy are developed during remedial design (RD), an engineering phase that precedes the RA. The specifications are based upon the detailed descriptions of the selected remedy and the remediation/cleanup criteria provided in the ROD.

e. Remedial Action. The RA is the implementation of the selected remedy from the ROD and the RD. RA activities must conform to the remedy set forth in the ROD and other post-ROD decision documents (e.g., ROD amendments, explanation of significant differences). The remedial action includes the completion of an operational and functional (O&F) period (Paragraph 2-2.a), if necessary, followed by any long-term response action (LTRA) for groundwater or surface water remedies (Paragraph 2-2.a), prior to long term operation and maintenance (O&M) of the remedy.

Exhibit 2-2
Example Pipeline Scenarios



f. Operation and Maintenance. Operation and maintenance (O&M) are the activities required to maintain the effectiveness or the integrity of a remedy. O&M is dependent on the implemented remedy. O&M may not be necessary, may only be required for a defined timeframe, or may be required to be performed indefinitely.[4] For remedies that require active on-site treatment, remedial system evaluation or optimization is an important component of O&M.[5] Except for Fund-financed groundwater or surface water restoration actions covered under NCP §300.435(f)(4), O&M measures are initiated after the remedy has achieved the remediation objectives and cleanup goals listed in the ROD, and is operational and functional (Paragraph 2-2.a). O&M starts when the RA is complete and the State or the PRP(s) assume responsibility for all activities necessary to operate and/or maintain the long-term effectiveness or integrity of the actions selected in the ROD. In the case of Fund-financed measures to restore groundwater or surface waters, that extend beyond the ten-year long-term RA period (Paragraph 2-2.b), O&M is required to continue the operation of such measures until the cleanup goals are achieved.

2-2. Remedial Action Process. Besides the RA and O&M phases, the RA process typically includes the operation and functional period, long-term response, cleanup goals achieved milestone, and five-year reviews. Exhibit 2-2 provides three different pipeline scenarios to help illustrate when these periods occur in relation to preparation of the RA report. The following paragraphs provide a brief description of each phase or milestone.

a. Operational and Functional

(1) Operational and functional (O&F) activities are conducted after the RA has been constructed to ensure that it is operating as designed and functioning properly. The O&F period is part of the RA and occurs during the last year of the RA. The NCP provides for a maximum timeframe of one year for performing O&F activities, though EPA may extend the one-year period, as appropriate. O&F determinations are made for containment (all media), groundwater restoration and surface water restoration remedies.[6] Monitored natural attenuation remedies do not go through an O&F determination.

(2) A remedy becomes O&F either one year after O&F start, or when the remedy has been determined, concurrently by EPA and the State agency, to be functioning properly and performing as designed, whichever occurs first (40 CFR 300.435). O&F is considered to be complete on the date that the designated Regional official approves, in writing, the interim RA report (for sites with groundwater or surface water restoration remedies) or final RA report. This

[4] Examples of remedies where O&M may have an indefinite period of performance are sites where waste is contained on-site and the integrity of the cap must be maintained or sites where institutional controls must be maintained.

[5] Additional information on remedial system evaluation or optimization is available on the web at *http://www.frtr.gov/optimization/*.

[6] Formal O&F determinations are made primarily for Fund-financed projects because the O&F milestone governs when O&M or Long-Term RA (LTRA) begins under State authority. Federal facilities-lead projects go through determinations known as "operating properly and successfully."

report should not be approved until the determination has been made through an inspection that the remedy is, in fact, O&F (Paragraph 2-3).

b. Long-Term Response.

(1) Long-term response action (LTRA) and PRP long-term response (LR) are sub-actions of O&M used to track and assure continued Federal funding for the operation of groundwater or surface water restoration remedies.[7] LTRA is defined as the Fund-financed operation of groundwater and surface water restoration measures, including monitored natural attenuation, for up to the first ten years of operation. LTRA is complete after ten years, after a technical impracticability determination is made, or after cleanup goals are achieved and documented in a final RA report, whichever occurs first. LTRA transitions to traditional O&M if cleanup goals are not achieved, or if continued monitoring is required, after ten years have elapsed.

(2) In the past, the term LTRA has been used to describe PRP-lead groundwater and surface water restoration measures, including monitored natural attenuation. However, PRP-lead groundwater and surface water restoration measures, including monitored natural attenuation, are covered by a separate action, PRP LR. Because PRP LR is a specific type of O&M, the ten-year timeframe does not apply. PRP LR is complete after a technical impracticability determination is made, or cleanup goals are achieved and documented in a final RA report, whichever occurs first.

c. Cleanup Goals Achieved. Usually preceded by the interim RA report, this milestone signifies when cleanup goals are achieved for groundwater and surface water restoration, including monitored natural attenuation. "Cleanup goals achieved" is officially accomplished once the final RA report is approved in writing.

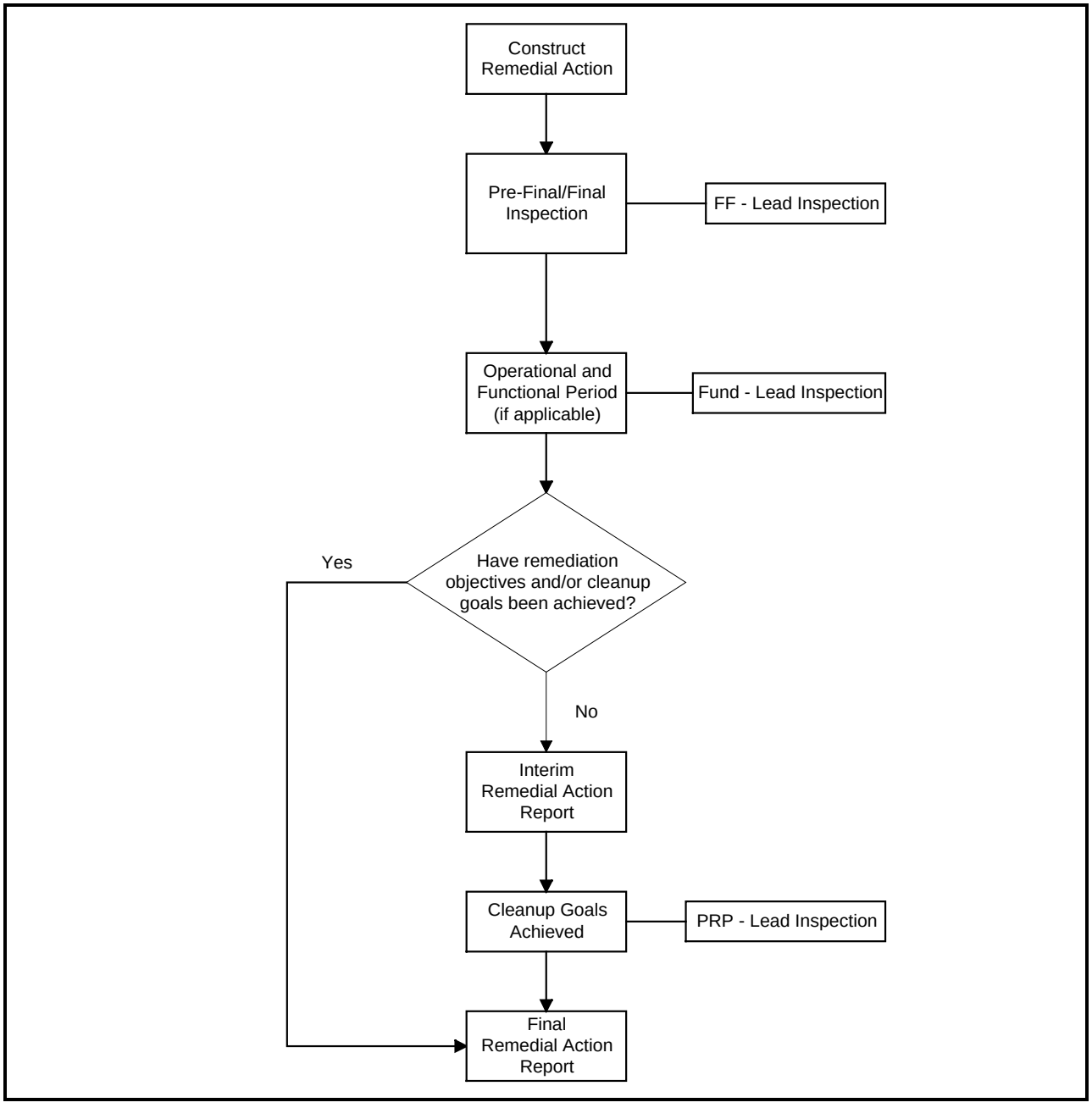
d. Five-Year Reviews. If there are any hazardous substances, pollutants, or contaminants remaining at the site above levels that do not allow for unlimited use and unrestricted exposure, EPA is required to conduct a review of the RA at least once every five years to assure that human health and the environment are being protected. CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) provide the legal bases for conducting five-year reviews. Generally, five-year reviews may be discontinued when no hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

2-3. <u>Remedial Action Completion</u>. The RA for an OU is complete after the remedy is determined to be O&F (if applicable), the remediation objectives and/or cleanup goals stated in

[7] LTRA and PRP LR apply to groundwater and surface water restoration measures only, including monitored natural attenuation. These terms do not apply to groundwater and surface water restoration measures conducted under other leads; groundwater or surface water containment measures; groundwater or surface water measures initiated for the primary purpose of providing a safe drinking water supply; or groundwater monitoring. Federal facilities-lead sites do not use LTRA or PRP LR. Instead, groundwater and surface water restoration measures go from RA directly to O&M at these sites.

the ROD are achieved, and the designated Regional official has approved the interim or final RA report. Exhibit 2-3 illustrates the remedial action completion process.

Exhibit 2-3
Remedial Action Completion Process



a. Inspection Requirements.

(1) General. With any RA, regardless of lead or contracting party, the standard practice is to conduct contract pre-final and final inspections prior to RA completion. These

inspections are conducted to determine whether the construction is complete in accordance with the contract design and specifications. The inspections are generally held between the contracting party and the construction contractor, although others can be invited. If all the items observed during the contract pre-final inspection are corrected or are considered insignificant, the contract pre-final inspection may automatically serve as the contract final inspection. Otherwise, a contract final inspection will be conducted later by the contracting party to determine if these items have been corrected and completed in accordance with the RD plans and specifications. In addition to the pre-final and final inspections, other inspections may be required prior to completion of the RA. These include Fund-lead, PRP-lead, and Federal facility (FF)-lead inspections as described below.

(2) Fund – Lead. The NCP requires an additional set of inspections at Fund-financed sites that will undergo LTRA and/or O&M. During this set of inspections, EPA and the State concurrently determine the end of the O&F period. After an O&F determination is made, the remedy enters LTRA or O&M. If convenient, these inspections may be conducted concurrently with the contract pre-final or final inspection.

(3) PRP – Lead. For PRP-lead sites, the Revised Model CERCLA RD/RA Consent Decree (Federal Register, Vol. 60, No. 145, pp. 38817-38837, July 28, 1995) requires a pre-certification inspection upon completion of the RA. This inspection, which involves the PRP(s), EPA, and the State, is intended to determine if the RA is fully complete and if the remediation objectives/cleanup goals are attained. After the pre-certification inspection, the PRPs are also required to submit a written report, for EPA approval, stating that the RA is complete in full compliance with the requirements of the Consent Decree. If it contains the proper information, this report can serve as the RA report for the OU. For groundwater and surface water restoration remedies, where an interim RA report is appropriate, EPA may require the preparation of a separate (interim) RA report for groundwater or surface water, since it is not normally required in the Consent Decree.

(4) FF – Lead. Federal facility agreements (FFAs) generally require an additional set of inspections to determine that all aspects of the remedy have been implemented in accordance with applicable enforcement documents and the ROD. Participants include the EPA, Federal facility, oversight contractor, and the State. These inspections may be conducted concurrently with either of the pre-final or final inspections described above.

b. Remedial Action Reporting. When the RA for an operable unit is complete, the RA report is prepared. There are two basic types of RA reports, interim and final. An interim RA report is completed only for RAs that include groundwater or surface water restoration remedies, including monitored natural attenuation. Interim reports are used because of the extended duration between the completion of the treatment system construction (or the ROD signature, in the case of monitored natural attenuation) and the achievement of the cleanup goals. A final RA report is complete when the remediation objectives/cleanup goals are achieved. More detailed information on preparation, timing, distribution, approval, and review of RA reports is provided in Chapter 3.